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THE VALUE OF A COMBINED INSECTICIDAL AND CULTURAL
PROGRAM FOR CONTROL OF COTTON INSECTS
IN THE LAGUNA OF MEXICO

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The pink bollworm (Pectinophora gossypiella (Saund.)) was introduced into the Laguna of Mexico in 1911, and by 1916 it had become generally distributed over this region, which is in the States of Durango and Coahuila. In the early 1920's the infestations were uniformly heavy and causing severe damage. By the late 1920's the insect had become so well established that in most cotton fields almost all the bolls were infested by the latter part of each season (Rude 1953). The pink bollworm became the most serious cotton pest in the Laguna, overshadowing the boll weevil, bollworm, and the conchuela.

During those early years little effort was made to control the pink bollworm and attempts to control other cotton insects had no effect on this pest. Such control as was obtained of boll weevil (Anthonomus grandis Boh.), bollworm (Heliothis zea (Boddie)), and conchuela (Chlorochroa ligata (Say)) was nullified by the heavy damage caused by the pink bollworm. By about 1930 the infestation had reached a static level with a seasonal average of approximately 75 percent of infested bolls and 6.3 larvae per boll.

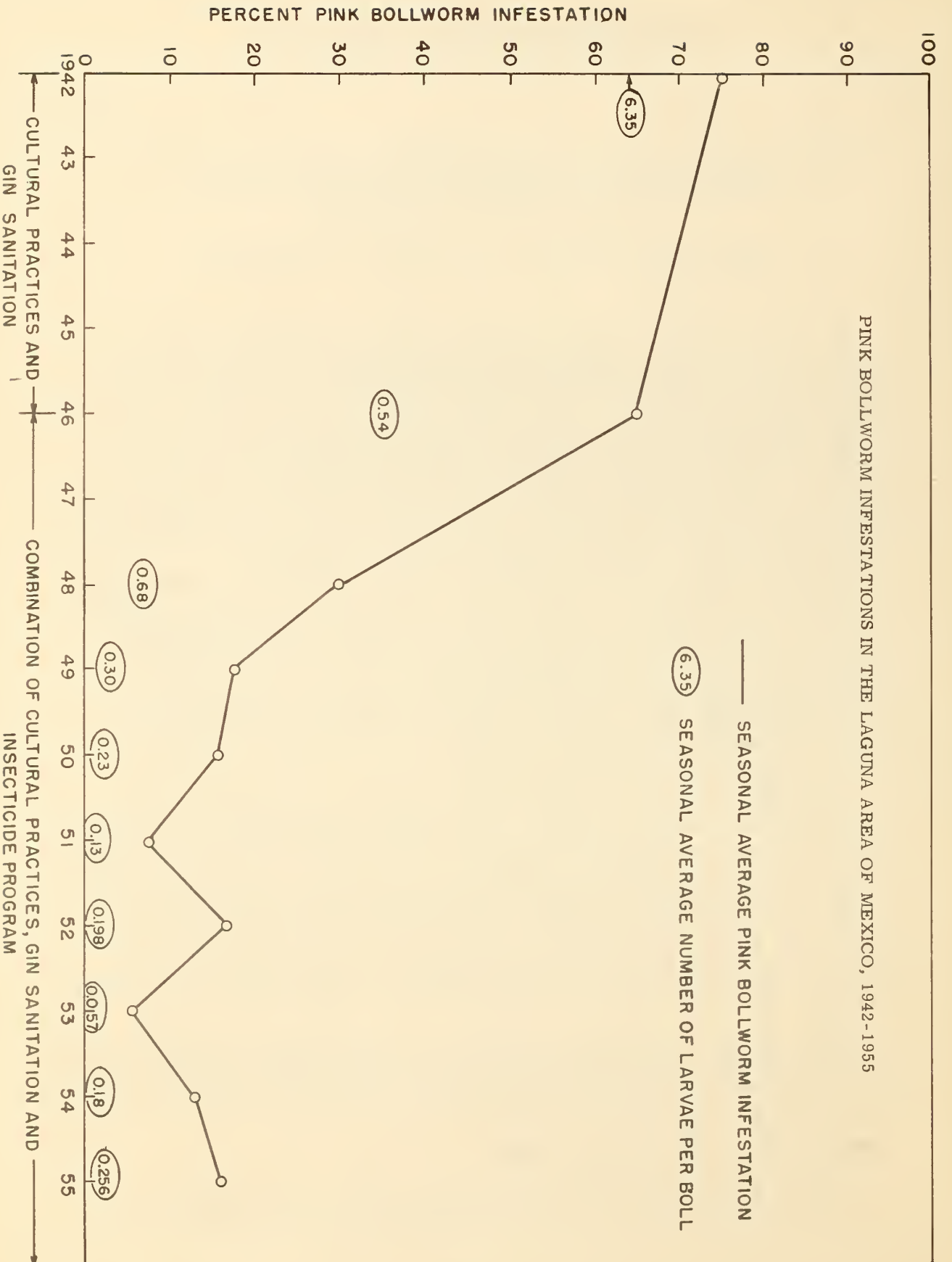
In 1942 an intensive cultural-control program was inaugurated. This program stressed the early and complete destruction of the cotton plants followed by deep plowing, and no soca cotton was allowed to grow. It was also required that all cottonseed be heated to a point where pink bollworm larvae would be killed. These measures were faithfully carried out for 5 years, and by 1946 the seasonal average infestation had been reduced to 65 percent, with only 3.5 larvae per boll. However, the population was still high enough to cause serious commercial damage.

Experiments in 1946 and 1947 demonstrated the value of DDT as a chemical control for the pink bollworm. In 1948, with cultural practices still stressed, approximately 40 percent of the cotton acreage of the

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PINK BOLLWORM INFESTATIONS IN THE LAGUNA AREA OF MEXICO, 1942-1955



Laguna was treated with DDT. The results were highly satisfactory. The seasonal average infestation was reduced to 30 percent, with only 0.6 larva per boll. In the following years the use of this insecticide became more general until in 1951, with approximately 99 percent of the cotton acreage treated, the average seasonal infestation was brought down to 7.8 percent, with only 0.13 larva per boll--well below the level where commercial damage would occur.

With pink bollworms reduced to a point where they caused little commercial damage, the growers gave all the credit to the insecticides and became careless and neglected to destroy the cotton stalks. In many fields plowing was neglected, and in many others it was delayed from 6 weeks to 2 months. As a result, in the spring of 1952 the cotton growers of the entire area found themselves faced with a high potential pink bollworm population. The early-season infestation in blooms was 5.3 percent, which was the highest since DDT had been used. It was clearly evident that a combination of cultural practices and use of insecticides is essential for satisfactory control.

Early in the studies of such a combined program it became apparent that the control of the pink bollworm alone was not enough. Certain other cotton pests could build up sufficiently to offset the benefit obtained by pink bollworm control. It therefore became necessary to devise a combination treatment. After several years it was found that for use in the Laguna a mixture commonly called 2-10-40 was highly satisfactory. This mixture contains sufficient BHC to give 2 percent of gamma plus 10 percent of DDT and 40 percent of sulfur. The BHC controls the aphids and the small boll weevil population present in the area; the DDT controls the pink bollworm, conchuela, and bollworm; and the sulfur reduces spider mite buildup.

The proper timing of the insecticide applications is of great importance. Experiments have shown that the most effective and economical plan in the Laguna is to make the first application when the cotton plants have from six to eight leaves, the second 7 days later, and the third application 21 days after the second. Later applications should be made as needed to control the bollworm and other pests. Some growers prefer to wait until pink bollworms are observed before they start insecticide applications. Usually, when this plan is followed, more applications are required and less effective pink bollworm control is obtained.

In the Laguna the combined insecticide-cultural control program has been in use since 1948, with the result that the average seasonal pink bollworm infestation has been 15.3 percent. The accompanying graph shows the progress that has been made, and also how much more effective the combined program has been than were cultural practices alone. Under this program bollworm control has been highly satisfactory, the conchuela has done practically no damage, and aphid populations have

not been of serious consequence. Spider mite populations have in general been kept in check, although control of this pest has not been entirely satisfactory. No boll weevils have been reported in this region in the last 5 years, whereas previously they were numerous.

The control program also improved the yield and grade of cotton. For the 5-year period 1936-40, before the control program was started, the average yield was 1.4 bales per hectare and 58.5 percent of the crop was middling or better. Since 1949, after the combined program became general, the average yield has been 2.8 bales per hectare and 78.2 percent of the crop was middling or better.

Literature Cited

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